

MINISTRY OF DEFENDER

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LAND ROVER DEFENDER REPLICA TDCI GAUGES

*For use with all Puma Dashboard Conversion kits
Suitable for all Defender models up to 2007, regardless of engine.*



PUMA
AUTOMOTIVE DESIGN LTD



YOUR REPUBLICA PUMA INSTRUMENT CLUSTER

Installation Guide

IMPORTANT NOTE: It is essential that your new Puma Instrument Cluster is correctly earthed/grounded, ideally directly to the main battery earth. They **MUST NOT** be wired as part of any shared earth circuit as the gauges can be sensitive to ground loops.

Ground loops are a major cause of noise, hum, and interference in sensitive electrical systems, so it is vital to ensure that such circuits are given their own dedicated earth/ground.

CAUTION : As a safety precaution, the power wire to this product should be fused at 10a before connecting it to the gauges.

INSTALLATION NOTES:

Although we have tried to simplify as much of the fitting process as possible, it may be that you need assistance with some aspects of the installation or to explain the wiring layouts. A quick message before starting the install can save many hours of frustration. If you are unclear about anything please email us.

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RPM TACHOMETER

Our Puma Instrument Cluster is available for diesel engines (0-6000rpm range) or petrol/gas engines (0-8000rpm range). Ministry of Defender is unique in being able to offer multi-fuel variants of Tdci style instrument gauges to suit all engines.

With the main power and earth/ground wires to the cluster securely connected, the only other element required to run the tachometer is the RPM Signal Wire.

The gauges are designed to work with the W-Feed signal wire from your engine's alternator (marked on the alternator as W). If your alternator does not have a dedicated W-Feed it is possible to add one by attaching a wire straight to one of the alternator stator wires.

The below videos show how to add W-Feeds to different alternators. They are provided here as a help guides only.

<https://www.youtube.com/watch?v=43TaVoDpzH8>
<https://www.youtube.com/watch?v=kseFhAAVn4o>

Note: If your engine has an ECU then it may be possible to run the signal wire from the ECU's tachometer feed instead. However, the Hz frequency generated by its sensor may be too high. Therefore, we always recommend using a W-Feed.

The Signal Wire is to be connected to the Orange/Red wire on the Puma Instrument Cluster. The signal frequency from your input wire will vary from engine to engine and will give a different reading depending on strength. Therefore, the initial RPM reading on the dial may not be accurate.

The display needle position can be adjusted via a cross headed screw on the rear of the Puma Instrument Cluster in order to achieve the correct visual reading.

Display Adjuster Screw



Average RPM at idle/tick-over should be 750-900rpm

When turning the adjuster screw, use small increments. Take care not to adjust the RPM reading too low or the needle will slip into a negative calibration and will not display any reading until a positive calibration is restored.



GPS Antenna

The speedometer on your new Puma Instrument Cluster is GPS satellite guided, making it highly accurate. The actual GPS antenna should be securely fixed to the vehicle bulkhead.

Note 1: The GPS Speedo measures the distance between two static points on the road, which makes it highly accurate but may not be as sensitive to rapid changes in speed in comparison to direct cable or radar speed measuring.

Note 2: The letters GPS will display on the screen until a satellite signal is secured. Once found, the display will show the odometer reading. The odometer measures overall distance in Miles but can be set to Km upon request. If no signal is found, an error measure will result. Sometimes the initial setup procedure can time out before finding suitable satellites. You can repeat the process by powering off and back on again. Poor signal strength may be due to vehicle location.



GPS SPEEDOMETER!

FUEL GAUGE

Check the fuel level and make a note of the needle position before removing the old dashboard gauge.

To install, simply attach the existing fuel sender wire (Usually Green/Black) to the Puma Instrument Cluster fuel gauge input wire (Purple).

The fuel gauge on your new Puma Instrument Cluster is set at the original working Ohm range as used on the original fuel tank sender unit. The fuel reading of the new gauge should therefore match the reading on the removed original Land Rover gauge. However, please bear in mind that aging and use over a long period can cause what is known as Ohm drift in the sender. Older wiring may also have voltage sensitivity.

If you find that your new Puma Instrument Cluster fuel gauge displays an inaccurate reading, outside of an acceptable tolerance, you may need to do the following:

- 1) Check that the fuel sender itself is correctly earth to a dedicated ground point.
- 2) Run a new sender wire (Green/Black) to the instrument cluster wire (Purple).
- 3) Replace the old sender unit on the fuel tank.



ENGINE TEMPERATURE GAUGE

This gauge supervises the engine's water temperature so as to avoid overheating and resulting engine damage. It is therefore important that the installation procedure is adhered to and the correct Temperature Sensor is used for the gauges. The correct Temperature Sensor is supplied with your kit.

- 1) Disconnect the negative (-) from the battery terminal.
- 2) Install the supplied 1/8 NPT threaded Temperature Sensor to the engine in place of your existing sensor. Please note that due to numerous engine variations, we are not able to guarantee that the supplied sensor will fit your motor and a thread adapter may be required.
- 3) The Black wire from the Temperature Sensor should have a secure and dedicated earth/ground connection.
- 4) Extend and connect the Temperature Sensor feed wire (Red) to the Puma Instrument Cluster input wire (Green).
- 5) Reconnect the negative (-) on the battery terminal.
- 6) **CAUTION:** Do not touch the Red sensor wire or the Green cluster wire to any live wire on the vehicle as this can damage the system permanently.



WARNING LIGHTS & WIRING

The warning and information lights on your new Puma Instrument Cluster each take their feeds from the existing vehicle wiring, which is part of the original Defender wiring loom. Individual wire colours can be found on the corresponding wiring diagrams supplied for your model. You will need to locate, connect and test in turn.

Note: The Oil Pressure and Battery Charge lights operate in a particular way. Both need an ignition live (+) feed and both require their own dedicated sensor feed.

With the engine OFF, the two sensor feeds act as earth wires (-), so that with the ignition ON, each light has one live and one earth, thus illuminating the warning lights. Once the engine starts, oil pressure builds and the alternator charges. This makes the two sensor wires switch polarity to positive (+). At this point, each light has two positives and the lights are extinguished.

Puma Instrument Cluster Wiring:

	<i>Dedicated!</i>
• RED	Ignition Power In
• BLACK	Earth/Ground
• GREEN/WHITE	Vehicle Lights ON
• PURPLE/RED	High Beam Lights ON
• WHITE/BLACK	Oil Pressure Low (Ignition Live)
• WHITE/BROWN	Oil Pressure Low (Engine Pressure Sensor)
• YELLOW/BLACK	Battery Charge (Ignition Live)
• BROWN	Battery Charge (Alternator Sensor)
• GREEN/BROWN	Left Indicator
• BLUE	Right Indicator
• GREY/BLUE	Low Fuel Warning
• GREY	Rear Fog Light
• ORANGE	Hand Brake ON
• GREY/BLACK	Glow Plugs Active
• YELLOW	Front Fog Lights (If Fitted)
• PINK	Trailer Lights (If Required)
• YELLOW/RED	Engine Management Light (ECU Models)
• WHITE	High Engine Temp Warning (Where Fitted)
• PURPLE	Fuel Level Input Wire (See Notes)
• GREEN	Engine Temperature Sensor (See Notes)
• ORANGE/RED	RPM/Tacho Signal Wire (See Notes)



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